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IS THE GREEN RIVER DAMNED. WILL YOUR CHILDREN KNOW THE GREEN RIVER

Kenneth L. Diem

Missouri Basin Scope
Kansas City, Missouri

1970

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...Know the Green River? prepared by the
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..know the Green River?

prepared by

the MISSOURI BASIN SCOPE
(STUDENT COUNCIL ON
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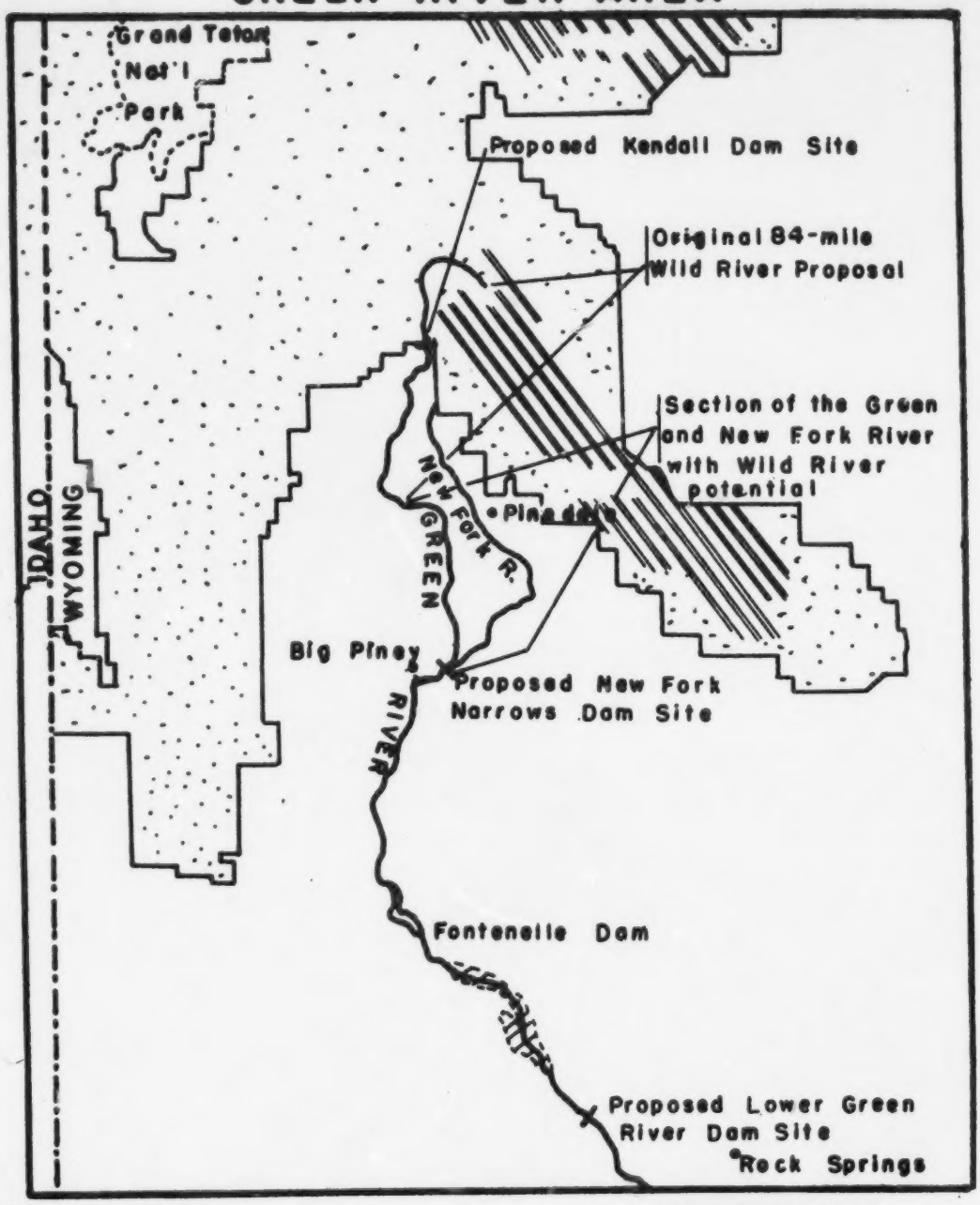
GREEN RIVER AREA



THE PINEDALE Roundup

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Were you listening Mr. Bishop.....

'We don't want NO damn dams here'

The above was the final statement made at the meeting Tuesday night to discuss the various plans for using the Green River water for the supposed good of Wyoming. This statement followed a forced vote by the large crowd present to let the representatives of the various state agencies know exactly how the crowd felt about the plans being offered. In the end Mr. Bishop was finally prevailed upon to ask for a vote as to whether or not the people wanted any of the dams built in the area, and in a show of hands not one hand was raised to show that anyone wanted any dam. So we must, and we hope Mr. Bishop also does, come to the conclusion that the vote was unanimous against any dams.

Representing the state agencies at the meeting were: Floyd Bishop, state engineer; Frank Trelease, director of water resources; Ken Sturman, state department of agriculture; Fred Eiserman, Game and Fish Commission; Myron Goodson, department of economic planning; and Art Williamson whose agency we did not find out as he was never called on to answer a question.

Mr. Bishop opened the meeting and gave a brief outline of the several proposals being offered. He also asked for questions from the group and any and all public expressions on the subject. (Here again there had been a lack of communications with the people as advance notices of the meeting had said nothing about submitting prepared statements and the only persons at the meeting with such statements were a group from Jackson who had also attended the meeting at Green River the night before.)

Frank Trelease then gave a talk, accompanied with slides, of the many proposals being considered. In his talk he stated that there were presently 29,000 people in the Green River Basin (by the way I didn't know until this meeting that the Basin extended east of Rawlins) and that in 50 years there would be about 60,000 people.

Total cost of the entire proposal, including land development, was estimated at $698 million, the Kendall dam would cost $124 million, the New Fork dam $125 million, and the Lower Green $121 million. It was further stated that the New Fork dam would be the cheapest per acre foot of water stored.

In the question and answer period Senator Don Jewett asked if the committee had investigated the raising of present lakes for the storage of water to meet the suggested requirements. Mr. Bishop stated that the Forest Service had placed so many unsurmountable obstacles in the way of such a plan that no such plan had been further developed.

Another question was asked as to whether it was feasible to cover 12,000 acres of good land to furnish water for 50,000 acres of questionable land.

A group from Jackson turned in a prepared statement, which in effect, said "leave the Green the way it is."

Keith Becker, representing Trout Unlimited, stated that this area had suddenly moved from 10 years behind the times to 20 years ahead of the national situation in control of pollution and that this proposal would set us back to at least ten years behind again. He also said that the report neglects to mention the value of the present lands in comparison to the value of the lands to be irrigated.

Miriam Barlow stated that irrigation of the 40-Rod area was unfeasible because of a bentonite layer which caused the river to flow in its present location and that if water was put on this land it would become a swamp. She further said that the Fontenelle Reservoir would not hold water because it was built on a sandstone formation and she thought the Kendall dam would prove to be the same type of fiasco.

Otis Carney, representing himself and the "Save the Green' committee, stated that the report is not realistic . He asked about letters which the committee had written offering alternatives, which Mr. Bishop's office had never answered. He also asked about many other letters and plans which had been offered to which no answer had ever been received. He finished his questioning by saying "Let's save Wyoming and its water for Wyoming and the nation".

Irv Lozier, representing himself and the Pinedale Ourfitters Association, stated that he owned land in the Eden area and that he was sure the local people knew that this was an impossible situation. He opposed the plans and asked that all present oppose the proposal.

Many other persons asked pertinent questions and many promised to write statements and mail them to the committee. Anyone wishing to write any address their statements to: Frank Trelease, Director of Water Resources, 2001 Central Ave., Cheyenne, Wyo. 82001, and they will go into the records.

STATEMENT ON PROPOSED GREEN RIVER WATER DEVELOPMENTS SUBMITTED TO STATE ENGINEER

CASPER HEARING, DECEMBER 10, 1970

Mr. Chairman, I am Kenneth L. Diem of Laramie. As a professional ecologist and wildlife biologist I am concerned about the unique environment of the free flowing Green River above the Fontenelle Reservoir. It is an irreplaceable state and national heritage which dams can only degrade and destroy. As a resident of Wyoming, I am vitally concerned with wise use of all of our resources, including the States's fiscal resources. As a planning report, Water & Related Land Resources of the Green River Basin, in Wyoming (1969), hereafter refered to as the Green River Planning Report, was hopefully awaited as a source of information on the objectives, alternatives and factors influencing the range of water choices. In this regard the Green River Planning Report did not live up to expectations. Presentation and evaluation of non-consumptive alternatives are conspicuous by their absence. It lacks the scope and unbiased considerations which are necessary for the public to make reasonable and enlightened decisions. The benefit-cost evaluations made in the report largely emphasized the benefits. Adverse effects are generally not fully considered.

Specifically, under price costs there is no mention of the disparity between proposed land acquisition costs listed in the Banner Report(1969) of $48 to $75 per acre vs the current prices of $350 to $2000 per acre for the 12,000 acres of private land to be flooded under the Kendall reservoir. Using an average value of only $300 per acre, the land acquisitions cost of $3.6 million for the 12,000 acres would increase the estimated Kendall dam cost to over $9 million. The validity of these figures can be substantiated with reference to a 1500 acre ranch which would be inundated by the Kendall dam impoundment. This ranch sold for $400,000 in 1963 and now it is up for sale for $600,000. Another large ranch near the Hoback Rim without streams or rivers recently sold for $250 per acre.

A rather large discrepancy of costs is noted in Table IV-3 of the Green River Planning Report where the reservoir cost for the Kendall dam with 390,000 acre feet is given as $6.6 million. In the Banner Report, from which that figure was supposedly taken (p.2-6), a cost of $7.5 million is given for the same reservoir with only 340,000 acre feet of storage. Correcting these Kendall dam cost estimates for the additional engineering costs, contingency costs and estimates for more realistic costs of land acquisition, the reservoir costs would exceed $10 million rather than the $6.6 million shown. Other construction costs were not scrutinized but this serious discrepancy does raise some question about the reliability of the other costs listed.

Another important construction cost not given is the cost for agricultural water distribution systems. In the Central Arizona Project, these costs are estimated to add $6-$8 per acre foot to the agriculture costs.

Financing costs for the project are muddled at best. Are the repayment rates given in Table IV-3 those estimated to be paid by the users in their actual prepayment contracts? Do these rated include an estimated financing interest charge for either general obligation or revenue bonding? Do these rates bring any direct return to the State Treasury at the same rate

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that current State water development loans bring or are all of the State agency efforts and expenditures, i.e., the cost of this study, core drilling expenses, etc. donated to the project? If the latter is the case should not the State expenditures made for these various water development studies under the Green River Project be listed as real costs to the project? Where are some estimates of minimum costs of operation and maintenance? Are they included in the repayment costs?

That answers to these questions are important is emphasized by the current Central Arizona Project difficulties. Arizona municipal and industrial users are balking at the prospect of having to pay $50 per acre foot plus estimated treatment costs of $20 per acre foot. Los Angeles pays $20 per acre foot for Colorado River water. Here in Wyoming, water is of a higher quality than that in the Lower Basin states, yet it is sold for $9.50 or less per acre foot to all users. What justification can be made for new water developments when one can seriously question if sound economic use is being made of Wyoming's existing water reserves? If Wyoming were to sell some 100,000 or more acre feet at $30 per acre foot to downstream users, would not this be Wyoming's greatest return with the lowest cost? The feasability of such a proposal is supported by the National Research Council (1968, p.58). A clearer exposition of the real cost of the system and now it might be paid for is needed for public evaluation.

Costs related to reduction in land values are only given in very limited terms. The most glaring ommissions are those related to possible income foregone from the loss of productive range lands, flooded farm lands and from possible losses of the tourist potential. River bottom lands can be very productive rangelands as well as farmlands. A basic consideration in the loss of these lands through flooding, even if the farmer makes a substantial capital gain (which is doubtful), is that the farmer can only move to poorer soil and thus bring inferior acreage into production with greater capitalisation per acre.

Possible losses to tourism would be related to the loss of the free flowing river sections under the proposed reservoirs at Kendall and the New Fork sites. Direct fluctuations in these two reservoirs can expose 60 per cent of the two reservoirs bottom surface as ugly mud flats. Such varying exposures of mudflats hardly serves to stimulate new tourist trade or even retain the present tourist visitations.

No estimate of the cost concerning losses in tax revenues from farm lands submerged under the various reservoirs is discussed. This is a real institutional cost to the respective counties and a real project cost. Where land acquisition requires condemnation proceedings, costs of those legal actions are costs to the project. The disparity of the current land prices and State listed acquisition costs strongly suggests that condemnation litigation could be extensive.

Certainly water developments on the Green River could foster directly or indirectly productive employment of capital and labor to the benefit of Wyoming. However, new roads, new schools, increased fire and police protection, enlarged sanitation facilities and other community services are also generally necessary. Where these services and facilities add more to the costs in the new area than is received as benefits, the difference must be listed as a cost to that water development. Industrial water users dependent on Green River water may have such impacts on the towns of Green River and Rock Springs.

A unique construction and land value cost is related to the sites of the Kendall and New Fork dams. The substrate of the Kendall reservoir site consists of glacial moraines composed of bouldery debris, glacial outwash, sand and alluvium. Much of this debris is very porous and permeable. The underlying bedrock is a sandstone which cannot be considered impermeable. In much harder and less permeable rocks in the Glen Canyon reservoir, water loss by leakage is estimated at 25-30 per cent annually of the total reservoir capacity, which when full totals 27,000,000 acre feet. Added to this are the problems of hydrostatic pressures on the already high water table from 150 to 190 feet depths of stored water in the reservoir. Even if there is only minimal seepage in a vertical plane, the lateral seepage through the glacial debris will certainly be large, if experience with leakey irrigation canals in the same area can be used. The impact of such lateral flows on one area alone, the New Fork river valley, adjacent to the Kendall reservoir is uncertain, but it could create a disastrous swamp condition in that area. No reference is made in the report to the findings of the Bureau of Reclamation borings in the Kendall dam site concerning the boring locations and the core contents.

With respect to the New Fork dam, the Banner Report (1969) refers (p.4-2) to a problem of "considerable" slumping in the south abutment area. The reservoir site consists of a sandstone substrate covered by alluvial deposits of clays, silts and gravels. Plastic clays are particularly prominent along the south side of the reservoir area. Fluctuating reservoir and river levels can be expected to cause considerable landslide damage. Mudflow landslides will be the most common type developing. No consideration this difficulty and the resultant deterioration of the water quality were made in the Green River Planning Report. Colloidal clay suspensions and loss of reservoir storage because of landslides cannot be overlooked. On very similar materials, an estimated 500 landslides developed above Grand Coulee Dam from 1941-1954. The cost of those landslides amounted to $20 million for the period 1934-1955; most of which was paid by the general taxpayer (Jones, et al, 1961). The principal cause of the Grand Coulee landslides was due to weakening of the sediments by groundwater. Downstream from the dam, a buildup of groundwater was also the principal cause of landsliding. These same conditions could be expected to prevail at New Fork reservoir and the Lower Green reservoir, as well as downstream from the Kendall reservoir.

Only limited attention to non-price costs has been given in the Green River Planning report. No mention is made of the current Scenic River study being conducted on the Green River by the U.S. Bureau of Outdoor Recreation. Comments or evaluations from the Wyoming Recreation Commission on scenic, historic or recreational values maintained or lost are very conspicuous by their absence. What impact would the proposed diversion facilities to the Sweetwater River have in the South Pass City area? What impact would the proposed increased flows into the Sweetwater River have on its value as a river being considered as a state wild and scenic river?

It is not made abundantly clear that 20-25 per cent of Wyoming's estimated population of 5,000 moose would be eliminated with the construction of the Kendall and New Fork dams. It is also not made clear that the moose population which would be destroyed by the Kendall dam is the largest single population of moose in Wyoming. Furthermore, the moose habitat to be flooded by the Kendall dam is unique to this extent that it supports the greatest density of moose per acre than any other moose habitat in North America.

Added to this loss is the destruction of the major portions of one of only four blue ribbon trout streams in Wyoming. There is no mitigation which can replace this or the moose loss. Reservoir recreation and reservoir fisheries are already available in quantity throughout Wyoming and the western states. They are a common commodity in comparison to the irreplaceable and unique moose, fishery and esthetic values of the wild Green River area. People are currently seeking ways to achieve some solitude and separation from the crowded, hectic life of urban and city life. Crowded resort life on reservoirs and lakes is a poor substitute for the unique qualities of a wild and scenic river. By now it should be very clear that the value of the Green River's natural features are not necessarily proportionate to the amount of use they receive. This is particularly true if we are holding that heritage in trust for our children.

I cannot understand why no attempt was made to include an esthetic evaluation of the river and its basin, as well as, astudy of the impact these proposed water developments would have on the esthetic values. Methods and procedures are certainly available as evidenced by Ian McHarg's (1969) Design with Nature and Luna Leopold's (1969) Quantitative Comparison of Some Aesthetic Factors Among Rivers.

Beyond the cost-benefit considerations, there is still the problem of the availability of water within the Colorado Basin. In 1965, the engineering firm of Tipton and Kalmback (Tipton, 1965) reported to Colorado's Governor Lover:

> The sum and substance of the matter is that the Colorado is a bankrupt river. It is rather futile for the states to argue as to what year in the future major shortages will occur among all states. Major shortages are occuring today.

Estimates on the annual flow of the Colorado River have ranged from 16.8 to 13.8 million acre feet. The lower estimate is being used currently. Under the Colorado River Compact and the Mexican Treaty, legal claims amount to 17.5 million acre feet.

Using 13.8 million acre feet, Wyoming's share of water under the Upper Basin Compact Act would be as follows (National Research Council, 1968):

Upper Basin States Gross Allotment	6.9 maf
Less Mexican Treaty Obligations	0.75 maf
	6.15 maf
Less Federal Lands Obligations (National Research Council, 1968, p. 23)	0.5 maf
	5.65 maf
Less Evaporation Losses	0.5 maf
Upper Basin States Net Allotment	5.15 maf
Wyoming's share, 14% of 5.15 maf(Channel and bank losses are not included).	721,000 acre ft.

With existing present uses of 296,000 acre feet and committed project usage of 244,000 acre feet, the total committed use is 540,000 acre feet (Anonymous, 1970a). Subtraction of this amount from 721,000 acre feet produces a balance remaining of 181,000 acre feet which is markedly less than the data in Table IV-2 (p.127) of the Green River Planning Report. Deducting proposed future uses of 231,000 acre feet, Wyoming's demands would exceed the available supply of water by 50,000 acre feet.

Since Wyoming appears to be considering water development on the Green down to the "last drop", determing the correct alloted annual flow of water is of paramount importance. A National Research Council Report (1968) on the Colorado River states:

> If for example, 13.8 maf had already been pledged to other developments, a new development planning to use 1.1 maf (on the basis of 14.9 maf) would be on precarious ground if it had a priority behind all prior developments.

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The report further states:

> Money invested in water developments may be jeopardized if present estimates of flow are in error by 10 to 20 percent, a range that is in fact rather small for estimates of natural phenomena.

Further complicating this problem is the fact that in the U.S. Supreme Court decision of 1963, involving Arizona vs California in the contest for Colorado River water, the ruling also affirmed the Secretary of Interior's power to allocate water in all areas of the Colorado River during times of shortage (National Research Council, 1968, p. 22-23).

In summary then, on the basis of presently available information, the construction of the Kendall and the New Fork dams have costs to Wyoming which exceed any benefits. Further, as mentioned in the Wyoming Green River Planning Report's recommendations, water needs of the Green River Basin can only be considered in conjunction with the water needs of the entire State. To do this, any final decision should then be postponed until the water plans for the other basins are completed and the present Green River Planning Report has the various errors and omissions corrected. For instance, 500,000 to 800,000 acre feet of unallocated water in the Big Horn River could very well be used in the Powder River Basin making a trans-basin diversion from the Green River unnecessary. Further, changing the priority of 250,000 acre feet of water in the Fontenelle Reservoir, now allocated to the Seedskadee project, to municipal and industrial use would reduce the necessity for impounding a large amount of additional water on the Green River. Agricultural economists Kelso, Martin and Young (Meek, 1970) estimate that in the Central Arizona Project, water used in agriculture generates $14 to $18 of income per acre foot of water used. The water for municipal and industrial use they estimate generates $80,000 income per acre foot. Since the new irrigation proposed in the Green developments is very marginal, one can seriously question whether that proposed agricultural use is the best use of the water.

On the basis of the foregoing considerations, I am opposed to any dams being constructed on the Green River or its tributaries above the Fontenelle Reservoir. The Saunders Reservoir proposal is not objectionable. The Lower Green dam is questionable. To take any less of a stand would derelict a responsibility for safeguarding Wyoming's resources and great environment. I cannot believe that any of us want to subscribe to the philosophy described by McHarg (1969) where he states:

> Money is our measure, convenience is its cohort, the short term its span and the devil take the hindmost is the morality.

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Friday, July 31, 1970

Green River Damned?

Fremont Lake near Pinedale, Wyoming, is the most unique body of water in the western United States. Those are the words of the distinguished scientist and conservationist Dr. Luna Leopold of the U. S. Geological Survey.

Dr. Leopold spoke to a large crowd at Pinedale, gathered to hear information for and against proposed water developments by the State of Wyoming. The developments could include fluctuating the water level on the large, natural lake.

The State also proposes building large reservoirs on the Upper Green River and on the Newfork River, a tributary of the Green. Such impoundments would flood many miles of free-flowing, blue-ribbon trout streams as well as most of the winter range for hundreds of moose, deer and antelope.

Leopold was very critical of the State for the manner in which it is conducting its water planning in the Green River Basin. He said people are not getting the facts; that they are unaware and apathetic. He said decisions are being made without the public's knowledge of the enormous impact made by resource developments. He cited such developments as clear-cut timbering and dam building. He noted that information on development and utilization of natural resources is often couched in terms that are difficult for a layman to understand.

Dr. Leopold was one of four speakers at a public meeting called by the Wyoming Outdoor Coordinating Council. Dr. Dave Love, also of the U. S. Geological Survey, presented new information on vast supplies of underground water which could be developed in lieu of the destructive dams.

Dr. Leopold has done extensive hydrologic studies on Fremont Lake. (He is one of the world's formost hydrologists.) He said Fremont Lake has qualities found in few other lakes of the world, including Lake Baikal in Russia. The water is so clear that a measuring device can be seen at 28 feet, a clarity practically unheard of.

The lake is formed by glacial moraines. It has a sounded depth of 603 feet and a great expanse of the bottom is flat with an average depth of approximately 600 feet. Oxygen in excess of that required to sustain trout occurs all the way to the bottom. The lake water is nearly neutral, meaning it is much like distilled water. There is no bacterial contamination which can be detected and there is no eutrophication (aging) detectable.

Dr. Leopold said a fluctuation of the water level would lead to shore erosion and a changing of all the high-quality aspects of the lake. A fluctuation of seven feet, which had been anticipated by the Bureau of Reclamation, would lead to massive environmental degradation in and around the lake.

Dr. Love said he would like to submit an alternative proposal for development of water in the Green River Basin. He said an enormous underground aquifer (water bearing sands) of pure water occurs in the area of Big Piney in Sublette County (south of Pinedale). He said the aquifer was 6,000-7,000 feet thick. He said it was not controversial and not subject to evaporation. It occurs in the area where the proposed Wagon Wheel nuclear blast is being explored. It was discovered during the drilling for the project.

Dr. Love asked the question, why build large, controversial dams when the State could sell 500,000 acre feet of water to the lower basin states and use the money to develop wells - when the water was truly needed? He said the desireability of piping water transbasin (to the Platte River) was very costly and not necessary.

Dr. Love also said there was a known aquifer along the Sweetwater River which drains into the Platte. This aquifer is some 2,000 sq. mi. in extent and has already been extensively explored.

Another potential aquifer of enormous extent lies along the northeast flank of the Wind River Mountains in Fremont County and would be available for additional water supplies in either the Big Horn Basin or the Powder River Basin.

Dr. Love was very critical of both the Kendall and Newfork Narrows Dam sites proposed by the State. He said both could be expected to lose large amounts of water through seepage and evaporation.

Trelease was asked if the State's report and water plan would point out the losses of fish and wildlife and to the environment as a result of the dam building. His answer was that they had only considered the loss of land as determined by the cost of fishing access which runs about $800-$1,000 per mile of stream.

Comments from ranchers in the reservoir area indicated that State had used the figure of $46 per acre to compute costs of land acquisition. This was pointed out to be an unrealistic figure since some lands has already been sold for $1,200 per acre.

A question was asked as to what happens to water quality when irrigation water is put on such highly alkaline soils as the proposed Seedskadee project, the Soapholes country and others in the area. Dr. Leopold said the water would be degraded by both agricultrure and industry.

Dr. Leopold said clearcut timbering increases the water yield from a forest but the practice also significantly increases erosion and sedimentation. He said the Forest Service was not using available technical people to give them answers as to possible results from timbering on unstable soils and questionnable geologic areas.

Bishop was asked if the State was considering legislation to establish a quasi-public agency to handle revenue bonding for the Green River projects. He said legislation would be desireable to provide mechanics for setting up state bond revenues.

Recreation and Fish and Wildlife Considerations [2]

The authorized Seedskadee, Lyman, and Savery-Pot Hook Projects include provisions for recreation and fish and wildlife protection and enhancement. Fontenelle Reservoir of the Seedskadee Project, in addition to irrigation storage, has an inactive pool of about 195,000 acre-feet which presently provides for recreation and a fishery. The Seedskadee National Wildlife Refuge provides management for waterfowl and other wildlife habitat. Present Fontenelle Reservoir releases provide a stream fishery. Meeks Cabin and China Meadows Reservoirs, storage facilities of the Lyman Project, will have minimum reservoir pools of 3,000 and 2,000 acre-feet, respectively, for recreation and fish and wildlife purposes. Preliminary plans for the Savery-Pot Hook Project include provisions for maintenance of minimum fish flows and recreation facilities.

The proposed Eden Project Improvement would enhance fishing by the inclusion of a minimum pool in Sanders Ranch Reservoir and by the maintenance and stabilization of stream flows in Big Sandy River between Sanders Ranch and Big Sandy Reservoirs. The Big game habitat in the Eden area would not be measurably affected by the Eden Improvement except for some loss of moose habitat at the Sanders Ranch Reservoir site.

The Wyoming Game and Fish Commission reviewed the preliminary plans presented herein and advised the Water Planning Program of the impact of the various plans on game and fish resources in the following summary.

Kendall Reservoir

The reservoir on the Upper Green River at the Kendall site would have the following impact:

1. Approximately 26 stream-miles of excellent trout habitat, spawning and brooding areas would be inundated. This reach of the Green River is

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[2] Prepared cooperatively by Game and Fish Commission and Water Planning Program personnel.

designated as premium trout water, and only four percent of Wyoming's 13,552 miles of rivers and streams providing a fishery are classified as premium trout water. Changing the character of the river to a fluctuating reservoir will generally favor less desirable non-game fish at the expense of trout.

2. More than 11 miles of river adjacent to public lands and 15 camping units would be inundated. This access is valued at $132,000 based upon the cost to purchase comparable access in the immediate area.

3. Approximately 26 stream-miles of the existing 51-mile "long reach" float fishing water from Green River Lakes to Warren Bridge would be inundated.

4. When the active reservoir pool is emptied to the minimum pool during drought periods, about 7,300 acres of the total 12,500-surface-acre reservoir area would be exposed, and this area would be largely mud flats. This acreage is based on a 390,000-acre-foot reservoir with a 100,000-acre-foot minimum pool (5,200 surface acres).

5. The Kendall Reservoir area provides winter habitat for some 600 to 700 moose. During normal winters at least three-fourths of the moose herd obtains winter forage in the bottoms that would be inundated by Kendall Reservoir. A loss of this river bottom would be a serious threat to the Upper Green River moose, and only a small fraction of the existing population could be maintained. There is no replacement for the winter moose forage in this area. This loss could not be mitigated.

6. The Game and Fish Commission maintains a feedground at Black Butte, where from 150 to 200 elk are fed each winter. Approximately one-half of these elk move across the Green River from the west side. The reservoir would create a barrier for these elk in their movement. Also, the feedground would be inundated; thus, it would require the purchasing of land at another site and construction of new hay corrals and sheds. The problems and expense of moving elk to a new feedground location are difficult to predict. Deer and antelope migration in this area is generally in a north-south direction. The reservoir, along with additional structures, such as concrete-lined canals, would drastically interfere with their movement. Approximately 1,500 deer and 500 antelope could be affected adversely. Fur-bearing animal habitat within the reservoir section would be destroyed.

On the basis of preliminary plans, the Game and Fish Commission recommends a minimum pool in Kendall Reservoir of 90,000 acre-feet or a surface area of approximately one-third of the maximum acreage. At this elevation, which is 7,630 feet, the surface area would be approximately 4,900 acres. The minimum pool requirement is for fisheries maintenance purposes. The Commission also recommends the maintenance of stream flows in the stream below the reservoir of 300 to 400 cfs during July, August, and September, and 200 cfs during the winter months. These flows will stabilize the river and are considered a partial replacement of the stream that will be lost as a result of the reservoir. Without a fisheries maintenance streamflow of 200 cfs a reach of approximately 60 miles of premium trout water will be depreciated. The quality of remaining river flows in reaches under the influence of water diversions and without minimum flow considerations could be depreciated chemically and physically. Flow manipulations and periods of the year when maintenance is particularly critical would be contingent on project operation plans which are tentative at this time.

Fish screening devices for all major gravity canal diversions and overpasses for the passage of big game should be a mitigating feature of all plans.

In Plan 1, a minimum pool of 100,000 acre-feet would be included in Kendall Reservoir for fishery and recreation purposes. Water supply studies indicated that the average yearly reservoir fluctuation would be on the order of five feet, and drought period drawdowns of up to 32 feet would occur three times in the 35-year study period.

New Fork Narrows Reservoir

A reservoir at the New Fork Narrows site, not larger than 400,000 acre-feet, would cause the following environmental changes to take place:

1. Approximately 18 stream-miles of good to excellent trout habitat and excellent spawning and brooding areas would be inundated on the New Fork River. The fluctuating reservoir environment will generally favor non-game fish species.

2. More than 10 miles of river adjacent to public lands would be inundated. This access is valued at $100,000 based upon the cost of purchase of comparable access in the immediate area.

3. Approximately 18 stream-miles of the existing 42 miles of "long reach" float fishing water would be inundated.

4. Operation of the 400,000-acre-foot reservoir during drought periods to provide Green River Basin M & I and transbasin diversion water supplies would expose about 11,000 acres of the total 13,000-acre reservoir area. Operation of the 250,000-acre-foot reservoir during drought periods, to provide the Basin M & I and transbasin diversion from the Green River at Green River, Wyoming, would expose about 5,000 acres of the approximately 8,000-acre total reservoir area.

5. The inundation of river bottom land would eliminate habitat for about 150 moose and a few deer. A reservoir in this area of the New Fork would seriously affect the migration routes of approximately 6,000 antelope because the winter range between Green River and the New Fork River is receiving maximum winter use, and an attempt is being made to encourage some of these antelope to move south across the New Fork River to other range. Some years, because of weather conditions, it is necessary for these antelope to move into the desert south of New Fork in order to survive. Also, the reservoir would destroy habitat for an abundant duck and goose population and a fair population of furbearing animals.

An analysis of the proposed operations of the New Fork Narrows Reservoir indicates that yearly fluctuations will average five to eight feet over a 35-year period. Maximum drawdowns of 32 feet and 60 feet, depending upon the size of reservoir, will be possible. The Game and Fish Commission points out that extreme fluctuations at any time or drawdown exceeding eight feet would represent a reduction in fish habitat. A quality fisheries habitat and dependable recreational facilities are contingent on the maintenance of the normal average annual fluctuation.

The Wyoming Game and Fish Commission suggested minimum flow releases of 225 cfs during the winter and 400 cfs recreation flow during June, July, August, and the first week of September. This would maintain the fishery of approximately five miles of stream in the New Fork River between the dam and the Green River.

Lower Green Reservoir

The Lower Green Reservoir would be the least damaging to fisheries and other water-oriented recreational interests of the three main stream reservoirs proposed. The reservoir would not encroach upon the Seedskadee Wildlife Refuge area except for causing backwater in the stream channels on both sides of Big Island in the Lower Refuge area. The reservoir would also lessen the silt load entering the upper end of Flaming Gorge Reservoir. A primary consideration for the reservoir is for water-quality regulation, a feature which will also benefit the fisheries upstream from Flaming Gorge Reservoir.

The following environmental changes would result from the Lower Green Reservoir:

1. A reservoir of approximately 270,000 acre-feet capacity would inundate about 21 stream-miles of river. The reservoir environment would favor non-game fish over trout. The loss of the stream habitat at the Lower Green Reservoir site would have less impact on the Green River stream fisheries than at the other two sites being considered.

2. If the reservoir were drawn down to a dead-storage pool of about 15,000 acre-feet, about 7,500 acres of previously inundated area would be exposed.

3. Public access to about 14 miles of river fisheries would be lost. This would be partially mitigated by adequate public access to the reservoir.

4. At the present time, several hundred deer and 20 to 30 moose utilize the area which would be inundated by the reservoir. These populations would undoubtedly be lost for a stretch of about 15 miles. Antelope utilize this area also, but the impact would be very minimal upon this species. Waterfowl would benefit from a reservoir, which would create a brooding area. The Lower Green River Reservoir would have the least detrimental impact upon game of all water developments in the Basin.

The Game and Fish Commission recommended a minimum pool in the Lower Green Reservoir of 58,000 acre-feet for recreation and fishery purposes.

Boulder Lake and Fremont Lake Reservoirs

The utilization of Boulder Lake Reservoir as a part of the East Side Project would have ramifications to both game and fish populations. However, these may be of somewhat less concern than at other reservoir sites because of present water development activities in the drainage.

The enlargement of Fremont Lake Reservoir in which a three-foot fluctuation is proposed would probably not have a severe effect on either game

or fish. A three-foot fluctuation would probably have little effect on the recreational use of the lake, although the exposure of three feet of steep shoreline might have some effect on aesthetic qualities of this area. A large fluctuation of Fremont Lake could reduce or eliminate the natural spawning of mackinaw trout and could have a severe impact on recreational values.

Transbasin Diversion to the North Platte River

Diversions of water into the North Platte River could enhance the fishery and recreational values in that river system. If the North Platte River reservoirs could be maintained at higher levels, both fishery and other water-based recreation would be enhanced. Waters added to the North Platte River above Seminoe Reservoir could enable favorable reservoir and river manipulation in the entire North Platte Reservoir system to the advantage of all water-based recreational development in this drainage. Diversions into the Sweetwater River from the Green River could have benefits to the fishery habitat. Advantages to habitat in the Sweetwater River, however, would be contingent on flow release patterns that would not deteriorate the natural stream channel by erosion or through man-made re-channelization to handle the increased flow expected with the diversion.

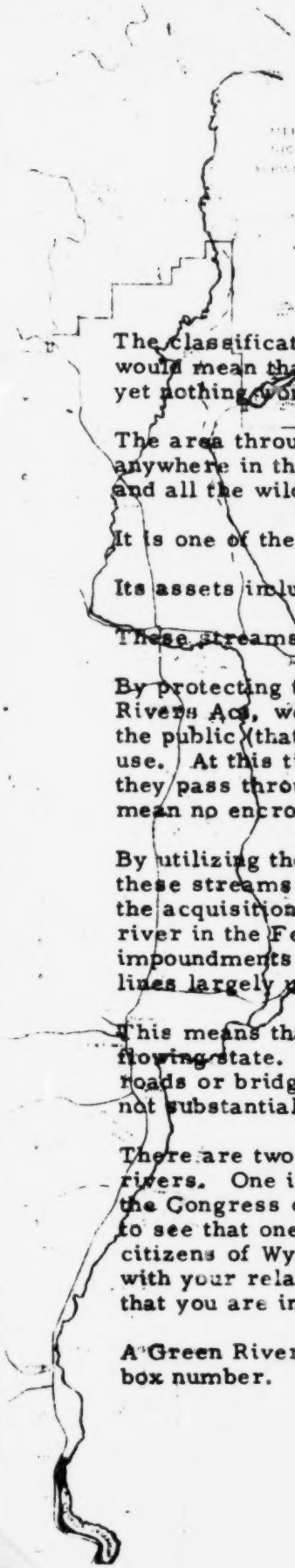
GREEN RIVER PROTECTIVE ASSOCIATION

FORMED FOR THE PURPOSE OF ACCOMPLISHING THE DESIGNATION AS A SCENIC RIVER, UNDER THE NATIONAL WILD AND SCENIC RIVERS SYSTEM, THE NEW FORK RIVER AND THE GREEN RIVER PROPER FROM THE GREEN RIVER LAKES TO THE HEADWATERS OF FONTENELLE RESERVOIR.

P. O. BOX 2207, CASPER, WYOMING 82602

May 15, 1970

EVERYTHING TO GAIN--NOTHING TO LOSE



The classification of the upper Green and New Fork Rivers as scenic rivers would mean that these rivers would be preserved essentially as they are now, yet nothing would be lost, polluted or radically changed.

The area through which these rivers flow is so unique as not to be duplicated anywhere in the world. Elk in abundance are found here, and deer, antelope and all the wildlife of Wyoming are represented.

It is one of the finest of "blue ribbon" trout streams to be found anywhere.

Its assets include the largest concentrated Shiras Moose herd anywhere.

These streams offer the finest in canoeing and small boating available anywhere.

By protecting the stream beds of this area within the National Wild and Scenic Rivers Act, we will be preserving all these values plus establishing a right for the public (that's us, folks) to the use of the stream and its bed for recreational use. At this time we do not have the right even to wade these streams where they pass through private lands. The public deserves this right and it would mean no encroachment upon the land owners.

By utilizing the BLM, National Forest and State lands which are adjacent to these streams we can accomplish their designation as scenic rivers without the acquisition of any of the private lands in the area. The definition of a scenic river in the Federal law is: "Those rivers or sections of rivers that are free of impoundments with shorelines or watersheds still largely primitive and shorelines largely undeveloped by accessible in places by roads."

This means that no dams may be built so as to interfere with the rivers' free-flowing state. However, such designation will not prohibit the construction of roads or bridges, timber harvesting and livestock grazing and other uses that do not substantially interfere with public use and enjoyment of scenic river values.

There are two ways the Green and the New Fork can be designated as scenic rivers. One is by action of the Wyoming Legislature. The other is by action of the Congress of the U. S. The aim of the Green River Protective Association is to see that one of these bodies takes this action. Either way, the support of the citizens of Wyoming will be required. You can help by discussing this subject with your relatives and friends, and advising your State and Federal legislators that you are in favor of this scenic river designation.

A Green River bumper sticker is now available at 10¢ each. Write the above box number.

Allen Kuhn

Allen Kuhn
Executive Director

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GREEN RIVER PROTECTIVE ASSOCIATION

[illegible] OF A CAMPAIGN FOR THE DESIGNATION AS A SCENIC RIVER, UNDER THE NATIONAL WILD AND [illegible] THE NEW FORK RIVER AND THE GREEN RIVER PROPER FROM THE GREEN RIVER LAKES TO THE [illegible] RESERVOIR.

P. O. Box 2207, CASPER, WYOMING 82602

February 23, 1970

WHY IS WYOMING DIFFERENT?

The state of Oregon is insisting that the Rogue River be protected under the Wild and Scenic Rivers Act of 1968. Idaho is trying to save the Middle Fork of the Salmon and the Middle Fork of the Clearwater with sections of the Lochsa and Selway under the same act.

Montana has formed a state agency, known as the State Recreational Waterway System, and has included for protection within this system the upper 180 miles of the Missouri River and considerable portions of the Yellowstone. It is now considering portions of streams like the Big Hole, Madison, etc.

In California, representatives of the most powerful conservation organizations have formed a coalition to create a "committee of two million" fishing license buyers to preserve the Eel, Trinity and Klamath Rivers for posterity as wild, free-flowing streams.

The foregoing are but a sampling of what is happening in a few states of our nation, but they bring to mind a question that the people of our state should be trying to answer: Why is Wyoming different?

The Green River Protective Association has been formed to assist the public in answering this and other questions pertaining to the future of our free-flowing streams. In essence, the Association is saying by recommending the upper Green River Drainage as a scenic river that no dams should be built on the Green proper or on any of its tributaries above Fontenelle Reservoir.

In future releases we will discuss the following:

*** the pros and cons of the Wild and Scenic Rivers Act.

**** the fact that no lands need be acquired by the Federal government if the Green is incorporated into the National Wild and Scenic Rivers Act.

*** the fact that the Act will in no way interfere with existing uses, such as livestock grazing, timber harvest or construction of roads or bridges.

*** proposals to save the water of the Green River for Wyoming's use without tampering with its upper reaches.

*** that presently the public has very limited use of the majority of its waterways.

If you are a member of a sportsman's club, please read this to your group. If you are an interested individual, show it and discuss it with your friends. You may assure yourself or your group of getting our next letter by writing to P. O. Box 2207, Casper, Wyoming. Your comments or suggestions are welcome. Donations of any amount to offset mailing expenses will be appreciated, but are not necessary.

Allen Kuhn

Allen Kuhn
Executive Director